

## **ATTACHMENT 10**

### **CLOSURE PLAN**

#### **Consisting of:**

- Attachment 10 - Page 1 through Attachment 10 - Page 37, as last revised December 1998
- Table C-1-18, page C-1-44; and Table C-1-19, page C-1-45; as last revised on September 26, 1988.

**10.1            CLOSURE PLAN [40 CFR 270.14(b)(13), (15), (16), (17), (18); 264.110-115; 264.178; 264.197; 264.351]**

**10.1.1        Closure Performance Standard [40 CFR 264.111]**

10.1.1.1      This closure plan is designed to provide for closure of the facility in a manner that will:

- Minimize the need for further maintenance
- Control, minimize, or eliminate, to the extent necessary to protect human health and the environment, the post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the surface or groundwaters or to the atmosphere

10.1.1.2      Final closure of the Tooele Chemical Agent Disposal Facility at the Deseret Chemical Depot will accomplish the goals of the closure performance standards, noted above, by (1) processing the entire demilitarization inventory located onsite at or before the commencement of closure activities through the Tooele Chemical Agent Disposal Facility, (2) removing and/or decontaminating all equipment, bases, structures, soils, or other materials containing or contaminated with hazardous waste or hazardous constituents associated with the hazardous waste management units located at the facility.

10.1.1.3      Post-closure maintenance or monitoring is not anticipated for the facility since no hazardous wastes or hazardous constituents resulting from the Tooele Chemical Agent Disposal Facility are expected to remain at the facility following final closure.

10.1.1.4      Following facility decontamination and removal of all process equipment, the stripped facilities will be monitored to assure removal or destruction of residual lethal chemical agent prior to certification of final closure.

10.1.1.5      After final closure, certification, and acceptance of closure by the EPA/state has been completed, the Tooele Chemical Agent Disposal Facility will no longer be classified as a hazardous waste treatment and storage facility. Following acceptance of final closure by the EPA/state, the structures remaining at the facility will remain under government custody and be reoccupied, dismantled, remain inactive, or be used as otherwise deemed appropriate by the U.S. Department of the Army.

**10.1.2        Partial and Final Closure Activities [40 CFR 264.112(a)(1)]**

10.1.2.1      At this point, no specific date for implementation of facility closure has been scheduled. It should be noted that the duration of the demilitarization activity is dependent on the release of munitions and bulk items from the installation stockpile for processing at the facility and the overall operational performance of the Tooele Chemical Agent Disposal Facility.

10.1.2.2 Final closure of the Tooele Chemical Agent Disposal Facility will be accomplished by an integrated sequence of partial closures (i.e., unit-by-unit closure operations). Closure of the Tooele Chemical Agent Disposal Facility will be conducted as expeditiously as possible following completion of the lethal chemical agent demilitarization operations. P.L. 99-145 requires that the facility (except buildings) be dismantled at the conclusion of demilitarization activities and not be used for other purposes.

10.1.2.3 All aspects of facility closure are briefly summarized in Table I-1-1 with detailed discussions of facility closure procedures included in 10.1.4.

**10.1.3 Maximum Waste Inventory [40 CFR 264.112(a)(2)]**

10.1.3.1 A small inventory of hazardous wastes in collection containers may be maintained in the brine salt packaging area of the Process Utilities Building awaiting transfer to the installation's Residue Handling Area for consolidation and shipment to an offsite licensed TSDF. The onsite inventory of munitions is continuously processed, however, and will be eliminated prior to implementation of facility closure activities. All spent filter media from munitions demilitarization activities will be disposed of before the commencement of closure activities.

10.1.3.2 Table I-1-2 presents estimates of the maximum amount of hazardous waste on hand during the operational life of the facility.

10.1.3.3 Wastes on hand at the facility at the start of closure may include brine in the dryer feed tank system and decontamination solution in the spent decontamination solution storage tank system.

Table I-1-1 TOOELE CHEMICAL AGENT DISPOSAL FACILITY CLOSURE SUMMARY	
Facility or Unit	Description of Closure Activity Following Removal From Service
Pre-Closure Activities Following Final Agent Processing Campaign	
Initial decontamination (xxx) <sup>1</sup>	Initial decontamination (XXX) <sup>1</sup> and certification of all areas as would be done during routine shutdown or during changes in agent or munitions type demilitarization processing.
Closure of Hazardous Waste Management Units	
Container Handling Building (CHB), Unpack Area (UPA), Explosive Containment Room Vestibule (ECV), Upstairs Munitions Corridor (UPMC), the S-2 warehouse, TMA Container Storage, and TMA Airlock/Decon Area  Note: TMA, UPA, ECV, and UPMC to be closed as part of the MDB closure.	Some of the site-generated waste and all waste munitions, containerized waste, and equipment/parts will be completely processed prior to commencement of closure. Structures decontaminated to (XXX) <sup>1</sup> level. Structures to remain intact following closure. Decontamination solution incinerated in Liquid Incinerators.
Toxic Cubicle and Spent Decontamination System Room Storage Tank (agent collection tanks and spent decontamination holding tanks)	Agent tank systems emptied prior to commencement of closure. Two of three spent decontamination holding tanks will be emptied and removed from service, while a third will remain in service until the Liquid Incinerators are closed. Tank systems are initially decontaminated (xxx) <sup>1</sup> and disassembled, followed by final decontamination (xxxxx) <sup>1</sup> in the Metal Parts Furnace, Dunnage Incinerator, or mobile incinerator <sup>1</sup> of all tank system components except those portions associated with the structure of the Munitions Demilitarization Building (i.e. concrete).
Deactivation Furnace System (feed chute, rotary kiln, hot cyclone heated discharge conveyor, and afterburner)	Initial decontamination (XXX) <sup>1</sup> , furnace disassembly, followed by final decontamination (XXXXX) <sup>1</sup> of disassembled parts <sup>3</sup> in the Metal Parts Furnace, Dunnage Incinerator, or mobile incinerator. <sup>45</sup>

Table I-1-1 TOOELE CHEMICAL AGENT DISPOSAL FACILITY CLOSURE SUMMARY	
Facility or Unit	Description of Closure Activity Following Removal From Service
Dunnage Incinerator (ram charger, Dunnage Incinerator lift, primary chamber, and afterburner)	Initial decontamination (XXX) <sup>1</sup> , incinerator disassembly, followed by final decontamination (XXXXX) <sup>1</sup> of disassembled parts <sup>3</sup> in the Metal parts Furnace or mobile incinerator. <sup>245</sup>
Metal Parts Furnace and afterburner	Initial decontamination(XXX) <sup>1</sup> , incinerator disassembly, followed by final decontamination (XXXXX) <sup>1</sup> of disassembled parts <sup>3</sup> in the mobile incinerator <sup>245</sup> .
Liquid Incinerators (primary chamber, afterburner, and third spent decontamination holding tank)	Initial decontamination (XXX) <sup>1</sup> , incinerator and tank system disassembly, followed by final decontamination (XXXXX) <sup>1</sup> of disassembled parts <sup>3</sup> in the mobile incinerator <sup>2</sup> .
Brine Reduction Area Treatment System	The Brine Reduction Area treatment system will close following final processing of materials through the Liquid Incinerators. If the mobile incinerator is connected to the Brine Reduction Area, then Brine Reduction Area closure will occur following the end of mobile incineration <sup>2</sup> . Removal of brine salts and residues to container storage, disassembly of tanks, dryers, and appurtenant equipment, followed by final decontamination cleaning. Collection containers of salts will be transferred to the installation's Residue Handling Area for eventual shipment to an offsite licensed TSDF. Decontamination waste generated during cleaning of equipment will be disposed of at an offsite licensed TSDF.
Mobile Incinerator(s) <sup>2</sup>	Not included in this closure plan since this unit must obtain a separate and independent RCRA operating permit.

Table I-1-1 TOOELE CHEMICAL AGENT DISPOSAL FACILITY CLOSURE SUMMARY	
Facility or Unit	Description of Closure Activity Following Removal From Service
Other Facilities (Not RCRA-regulated units or non-permitted units)	
Residue Handling Area and Spent Filter Media Storage Area in Toxic Maintenance Area, Munitions Demilitarization Building (container storage area for brine salts, incinerator and furnace ash and residues, baghouse, cyclone residues, and spent filter media)	<p>All containerized wastes from the Residue Handling Area will be shipped directly to an offsite licensed TSDF during closure of incineration system and Brine Reduction System. All filter media from demilitarization operations from the Filter Media Storage Area will have been incinerated prior to the commencement of closure activities. Following removal of final shipment of containerized waste, Residue Handling Area and Spent Filter Media Storage Area storage areas will be closed by decontamination (nonthermal cleaning methods).</p> <p>Decontamination solution will be incinerated in the Liquid Incinerators or mobile incinerator.<sup>2</sup></p>
Demolition of Process Equipment located in Category A, A/B, and B areas (including demilitarization machines, conveyors, and other miscellaneous equipment)	<p>Upon final processing of munitions through the facility, the Munitions Demilitarization Building and all associated facilities and equipment will be initially decontaminated (XXX)<sup>1</sup> according to routine operating procedures that are done during a change in agent or munitions demilitarization processing.</p> <p>All demilitarization process-related equipment such as the rocket drain and shear, bulk drain station, and other mechanical demilitarization equipment, and associated conveyors and support equipment will be disassembled. Disassembled parts<sup>3</sup> will be decontaminated (XXXXX)<sup>1</sup> in the Metal Parts Furnace, Dunnage Incinerator, or mobile incinerator.<sup>4</sup></p>

Table I-1-1 TOOELE CHEMICAL AGENT DISPOSAL FACILITY CLOSURE SUMMARY	
Facility or Unit	Description of Closure Activity Following Removal From Service
Munitions Demilitarization Building	<p>Upon final processing of munitions and waste stored in the TMA through the facility, the Munitions Demilitarization Building and all associated equipment will initially decontaminated (XXX)<sup>1</sup> according to routine operating procedures that are done during a change in agent or munitions demilitarization processing. Following initial decontamination, equipment removal will commence as noted above for individual hazardous waste management units and demilitarization process equipment. Following all equipment removal and closure of all RCRA-permitted tank systems and incineration equipment housed in the building, the Munitions Demilitarization Building (including the TMA, UPA, ECV, and UPMC container storage areas) will be finally decontaminated to (XXX)<sup>1</sup> level and monitored for agent for a minimum of 3 months as the final closure activity. Epoxy floor coating systems in category A, A/B, and B process areas will be sampled for presence of agent. If contaminated, coating system will be removed by grit blast techniques before final (XXX)<sup>1</sup> decontamination step.</p> <p>Decontamination solution from initial decontamination will be incinerated in the Liquid Incinerators (normal practice). Any decontamination solution produced after the Liquid Incinerators are decommissioned will be incinerated in the mobile incinerator.<sup>2</sup></p>

Table I-1-1 TOOELE CHEMICAL AGENT DISPOSAL FACILITY CLOSURE SUMMARY	
Facility or Unit	Description of Closure Activity Following Removal From Service
Munitions Demilitarization Building Ventilation System	Following shutdown and closure of the Liquid Incinerators, the Munitions Demilitarization Building ventilation system will be removed from service. Carbon and filters will be heat treated in the mobile incinerator, <sup>23</sup> depending on the schedule for decommissioning the furnaces. The remainder of the ventilation system will be initially decontaminated (XXX) <sup>1</sup> and disassembled. Following disassembly, the parts <sup>3</sup> will be decontaminated (XXXXX) <sup>1</sup> in the mobile incinerator. <sup>2</sup>
Monitor Support Building and Monitor Support Building Ventilation System	Will follow the same general closure procedures in agent-contaminated areas as for the Munitions Demilitarization Building and its ventilation system. Closure of this area will occur prior to shutdown of the mobile incinerator.
<p>1. See Section 10.1.4 for a description of decontamination procedures.</p> <p>2. If a mobile incinerator is not permitted and available for use at the Tooele Chemical Agent Disposal Facility closure, these wastes will be shipped off-site to a permitted TSDF for disposal.</p> <p>3. Following 5X decontamination, saleable scrap metal may be released from government custody.</p> <p>4. The mobile incinerator may be fitted during closure to use the pollution abatement system and/or Brine Reduction System during its operation.</p> <p>5. Disassembled equipment larger than 4 feet by 4 feet will be thermally treated (5X decontamination in a mobile incinerator).</p>	

NOTE: Operational specifications of the mobile incinerator are not discussed in this application; the RCRA operating permit for the mobile incinerator is separate from and independent of this application.



Table I-1-2  
MAXIMUM WASTE INVENTORY

Hazardous Waste Management Unit	Waste	Volume or Unit	Munition/ Agent
Container Handling Building	Agent (VX)	36,555 gallons	Ton Containers
The S-2 Warehouse	Site Generated Waste	38,720 gallons	N/A
Unpack Area	Agent VX	3,424 gallons	Ton Containers
Explosive Containment Room Vestibule	Agent VX	833 gallons	Ton Containers and Mines
Upstairs Munitions Corridor	Agent VX	4,366 gallons	Ton Containers and 155-mm Projectiles
TMA Container Storage Area	Agent- Contaminated	2,200 gallons	N/A
TMA Airlock Area	Agent (VX)	381 gallons	Ton Containers
TMA Decon Area	Agent (VX)	381 gallons	Ton Containers
Liquid Incinerators--Agent Feed Tank System (ACS-TANK-101,102 and ancillary equipment)	Agent	1,883 gallons	N/A
Brine Reduction Area Storage Tank System (BRA-TANK-101, 102, 201, 202 and ancillary equipment) Note 1	Scrubber Brine	188,800 gallons	N/A
Brine Evaporation/Dryer System (two evaporators (BRA-EVAP-101, 102), three double drum dryers (BRA-DDYR-101, 102, 201), two exchangers (BRA-EXCH-101,102), and ancillary equipment) Note 1	Scrubber Brine	7,250 gallons	N/A

Hazardous Waste Management Unit	Waste	Volume or Unit	Munition/ Agent
Spent Decontamination Holding Tank System (three tanks (SDS-TANK-101, 102, 103 - max. allowable working capacity = 2,200 gal each) and ancillary equipment, 1 sump @ 512 gallons, 57 sumps @ 89 gallons, 1 sump @ 85 gallons, 4 sumps @ 75 gallons, 1 sump @ 68 gallons and pumps and piping.) Note 2	Decontamination Solution	15,180 gallons	N/A
<u>Notes:</u> 1. Volume of ancillary equipment (e.g. piping, pumps, trenches, etc.) was assumed to be 10 % of the total tank capacities. 2. Volume of ancillary equipment (e.g. piping, pumps, trenches, etc.) was assumed to be 20 % of the total tank capacities.			

#### **10.1.4 Inventory Removal, Disposal, or Decontamination of Equipment [40 CFR 264.112(a)(3), 264.114, 264.351]**

- 10.1.4.1 Prior to closure, the inventory of munitions and agent in the Container Handling Building, agent tanks, and Munitions Demilitarization Building will be processed through the Tooele Chemical Agent Disposal Facility system. Prior to the commencement of closure operations, all hazardous waste residues originating from the final agent demilitarization campaign will be removed from the facility in accordance with normal operating procedures.
- 10.1.4.2 The closure of the hazardous waste units and areas of the facility will be completed according to the procedures discussed in this section. During closure operations, residues such as spent decontamination solution, scrap, and other residue will be generated. As described in greater detail in the following sections, some residues will be thermally treated in operable units active during the facility closure sequence or mobile equipment brought onsite during closure, or if a mobile incinerator is not permitted and available for use at the Tooele Chemical Agent Disposal Facility closure, these wastes will be shipped offsite to a licensed TSDF for disposal. Other residues, such as brine dryer salts (generated during closure) and cleaning residues will be disposed of offsite in accordance with normal operating procedures.
- 10.1.4.3 This section is organized in a manner that describes the general activities associated with closure of the Tooele Chemical Agent Disposal Facility, as well as specific RCRA permitted unit closure activities.
- 10.1.4.4 General Decontamination Procedures and Techniques
- 10.1.4.4.1 Decontamination of the facility will proceed after all demilitarization activities have been

completed and all munitions and agent have been incinerated. Closure will consist of decontamination of all buildings to the XXX level and all removable process equipment located in Category A, A/B, and B areas to the XXXXX level (see Figures I-1-1 through I-1-5 )<sup>1</sup>.

10.1.4.4.2 These cleanup levels are defined by the Army as follows:

XXX--Three Xs indicate that the item has been surface decontaminated by specific procedures and that appropriate tests or monitoring has verified that vapor concentrations of 0.0001 mg/m<sup>3</sup> for agent GB, 0.00001 mg/m<sup>3</sup> for agent VX, and 0.003 mg/m<sup>3</sup> for mustards do not exist. Items are to be free of grease and oils that may absorb agent. XXX decontamination generally is accomplished by chemical neutralization. Items decontaminated to XXX cannot be subjected directly to open flame or heat such as drilling and machining. Equipment and facilities decontaminated to this level must be retained and controlled in government custody.

XXXXX--Five Xs indicate that an item is clean (i.e., completely decontaminated), free of hazards, and may be released for general use or from government control without precaution or restriction. An Army-tested and approved method of achieving a XXXXX level is subjecting items to a sufficient temperature for a sufficient time to completely destroy agent. Such high-temperature thermal treatment is to result in no detectable residual agent contamination of the item treated. For disassembled items, heating the items to 1,000°F and holding them at that temperature for 15 minutes is considered sufficient. XXXXX condition must be certified by the commander's designated representative.

10.1.4.4.3 During closure activities, the independent registered professional engineer will review XXXXX decontamination records maintained by the facility Commander's designated representative. This review will be included in the unit-by-unit partial closure operations, as well as for final closure of the facility (see 10.1.12).

10.1.4.4.4 Chemical decontamination of structures and equipment will use water-based chemical solutions to neutralize (i.e., water react) agent residue that may be present. Table I-1-3 presents the decontamination solutions used for each type of agent and other nonagent-related general purpose decontamination solutions that may be used during closure activities. The decontamination solutions are sprayed on, poured on, pumped through equipment, and applied to areas where a potential for agent contamination exists. Neutralization is followed by a process or freshwater flush. All process related areas in the Munitions Demilitarization Building have sumps that are used to collect spent decontamination and rinse waters for transfer to the spent decontamination holding tanks located in the Toxic Cubicle.

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<sup>1</sup>All figures are included at the end of Section I.

Table I-1-3  
SOLUTIONS FOR CHEMICAL DECONTAMINATION

Process	Type of Agent Most Recently Handled	
	GB	VX, Mustard
Decontamination Solution <sup>11</sup>	Aqueous NaOH Solution	Aqueous NaOCl solution
Flushing Solution	Process or Fresh Water	Process or Fresh Water
General Purpose decontamination solution used for equipment and metallic surfaces (not for agent decontamination)	Trisodium phosphate (TSP) solution wash (1 lb of TSP per 10 gallons of water). Rinse with copious quantities of process or freshwater.	
Heavy duty cleaning solution <sup>12</sup> ; for nonmetal surfaces (e.g., concrete) and equipment with prolonged contact with inorganic (i.e., metals) contaminants (not for agent decontamination)	Tetrasodium ethylenediamine tetraacetate (1 to 2 percent), sodium tripolyphosphate (1 to 3 percent), trisodium phosphate (anhydrous) (1 to 3 percent), water (balance). Rinse with copious quantities of process or freshwater.	

- 10.1.4.4.5 Personal protective clothing and equipment for mustard and nerve chemical agent operations will be as detailed in the Contingency Plan, Attachment 9.
- 10.1.4.4.6 During decontamination, personnel working in a Category A (see Section 10.1.1) area will be required to wear the Demilitarization Protective Ensemble until the area has been decontaminated. Other areas will require the level of protection required during operations until the area is certified decontaminated by the installation Commander's designated representative
- 10.1.4.4.7 All post-decontamination air monitoring will be accomplished using agent ACAMS, DAAMS or an equivalent technique. Agent-contaminated areas will be decontaminated until agent is not detected and as otherwise indicated below for specific areas or regulated waste management units. Work in suspected agent-contaminated areas will cease until the agent DAAMS results are reported.
- 10.1.4.4.8 During decontamination operations, the ventilation system will remain in operation to ensure that agent vapors potentially present are not discharged to the atmosphere.
- 10.1.4.5 Munitions Demilitarization Building Area Closure
- 10.1.4.5.1 The Munitions Demilitarization Building area consists of the demilitarization building, which houses the Liquid Incinerator, Deactivation Furnace System, Dunnage Incinerator, and Metal Parts Furnace, and the associated tanks and pollution abatement systems for

each of these incinerators (located outside the building). General features of the overall decommissioning of the Munitions Demilitarization Building (including the TMA, UPA, ECV, and UPMC) and the non-RCRA process related equipment such as munitions handling equipment, conveyors, etc., are described in this section. Specific provisions pertaining to the closure of certain permitted systems (e.g., tank systems and incineration equipment) are discussed separately.

- 10.1.4.5.2 Closure of the Munitions Demilitarization Building area will require decontamination of the associated buildings and structures to the XXX level and all incinerators and related equipment located in Category A, A/B, and B areas to the XXXXX level. Equipment to be decontaminated to the XXXXX level will first be cleaned and certified to the XXX level using the appropriate decontamination solution as specified on Table I-1-3. A central decontamination solution supply system located in the Munitions Demilitarization Building will be used to mix, store, and supply the solution(s) to be used. Final XXX decontamination of the building itself (including the TMA, UPA, ECV, and UPMC ) will be performed once all equipment has been removed and decontaminated to the XXXXX level and closure of certain individual RCRA-permitted units (tank systems and incinerators) has been completed. The Munitions Demilitarization Building area closure decontamination procedure is generally shown in Figure I-1-5.
- 10.1.4.5.3 XXX decontamination (see Attachment 2, Waste Analysis Plan) is accomplished by washdown with decontamination solution followed by flushing with process or freshwater. This will be repeated as many times as necessary until agent vapor concentration levels, as determined by ACAMS and DAAMS analysis, meet XXX criteria. All spent decontamination solution from washdown of the building facility will be incinerated in the Liquid Incinerators, or in a mobile incinerator brought to the facility during closure operations, at 1,800°F to destroy any organic chemical residues in the solution, or if a mobile incinerator is not permitted and available for use at the Tooele Chemical Agent Disposal Facility closure, these wastes will be shipped to a licensed TSDF for disposal.
- 10.1.4.5.4 To facilitate decontamination, the following engineered features have been incorporated into the Munitions Demilitarization Building design:
  - 10.1.4.5.4.1 Surfaces of floors, walls, ceilings, and associated fixtures are free of crevices, cracks, protrusions, and other irregularities that could entrap material. As necessary, foundation subsoils are preconsolidated to reduce total and differential settlement. This reduces structural cracking.
  - 10.1.4.5.4.2 Internal angles, corners, and recesses are rounded with a radius larger than a minimum radius. For example, concrete corners have a 1-inch minimum cant and fixtures should have a 1/4-inch radius.
  - 10.1.4.5.4.3 Surfaces that contact agent or explosive have been selected and coated, polished, or machined to prevent or resist the adherence of liquids or solids.

- 10.1.4.5.4.4 Structural integrity is adequate to resist formation of leaks, cracks, and crevices due to stresses such as thermal and vibratory stresses. Concrete reinforcing steel allowable stress levels are reduced to lessen the size of normal concrete tension cracks.
- 10.1.4.5.4.5 Concrete surfaces in agent areas have been treated with an epoxy coating. This sealant spans and seals normal fine concrete cracks without loss of integrity. To aid epoxy adherence, concrete framework has a clean epoxy coating, and no wax paraffin or concrete curing agents have been used.
- 10.1.4.5.4.6 Overlapping metal surfaces in fixtures have been avoided except where sealed by welding. Exceptions may be gasketed openings, such as inspection and access ports.
- 10.1.4.5.4.7 Electrical fixtures are capable of continuous service when subjected to vigorous washdown with decontamination solutions.
- 10.1.4.5.4.8 Visual access is provided to all surfaces or spaces where material is likely to accumulate. When necessary for access, flooring grating is removable by personnel in Demilitarization Protective Ensemble.
- 10.1.4.5.4.9 Provisions have been made for flushing and draining, and for removing and collecting, rinsings in which agent or explosive may be entrained or dissolved. Cast-in-place concrete topped floors in Category A, A/B, B, and C areas are sloped to sumps. In Category A, A/B and B areas the floor is sloped at 1/4-inch per foot. In certain Category A areas the floor is sloped to embedded trenches, which then slope at 1/6-inch per foot to the sump. In the Explosive Containment Room the floor slopes at 1/4-inch per foot to a trench and the trench slopes at 1/8-inch per foot to the sump. In the Category C areas, the floor is sloped at 1/16-inch per foot to sumps. The precast concrete slabs act as forming for the cast-in-place topping and subsequently act integrally with it to resist live loads. Slab thickness is controlled by shear considerations and, because the trenches form "notches" in the slab, steel beams are provided on each side of the trench to provide slab support. The slabs are cast with embedded plates for welding to steel beams and, as required, are furnished with projecting reinforcing to ensure integral action with the cast-in-place topping.
- 10.1.4.5.4.10 Openings in barriers between areas at different category levels are limited in size to preclude loss of pressure differential.
- 10.1.4.5.4.11 Wall penetrations for electrical and instrumentation access are sealed to prevent vapor or liquid violation of areas separations.
- 10.1.4.5.4.12 The ventilation ductwork is designed to allow self-draining of spent decontamination solution to drain points. Ductwork has been designed to minimize dismantling of sections to accomplish decontamination. Washdown systems inside ventilation ductwork are not required.

- 10.1.4.5.4.13 The ventilation system is designed to preclude entrance of decontamination solution into the ductwork at air registers during routine decontamination activities. Either internal baffles or pitched airfoils shall be incorporated in the supply and exhaust registers.
- 10.1.4.5.5 Following initial XXX decontamination, the Category A, A/B, and B equipment in the Munitions Demilitarization Building will then be decontaminated to the XXXXX level. This will be accomplished in two steps--the first to clean to XXX in a manner similar to that followed for the building, and the second disassembly of the equipment to a size suitable for feeding to one of the remaining in-service furnaces for heating to 1,000°F for 15 minutes.
- 10.1.4.5.6 When an existing incinerator is not available for XXXXX decontamination or the treatment of wastes because it has been decontaminated and taken out of service, or the material is too large, a mobile incinerator, which will be brought to the site, will be used, or if a mobile incinerator is not permitted and available for use at the Tooele Chemical Disposal Agent Facility closure, these wastes will be shipped to a licensed TSDF for disposal.
- 10.1.4.5.7 Process equipment only required to be decontaminated to a XXX condition (Categories A, A/B, and B) will be disconnected from the power source and disassembled to the extent necessary to ensure decontamination of all (agent) accessible surfaces. Solids buildup will be removed from all surfaces. The equipment item will be washed with the appropriate decontamination solution for the suspect agent type(s), thoroughly cleaned if necessary with a detergent solution (see Table I-1-3) to remove surface oil and grease, and will be subsequently rinsed with freshwater. Steam cleaning will also be used as appropriate.
- 10.1.4.5.8 Decontamination of equipment to achieve a XXXXX condition will require disassembly and high-temperature thermal treatment. Equipment is not expected to remain serviceable after this decontamination. Disassembly of XXX decontaminated equipment will be performed by specially trained personnel wearing appropriate protective clothing.
- 10.1.4.5.9 Excess air will be provided to all external surfaces of each item during thermal treatment. Prior to or during thermal treatment, potential agent entrapments will be physically opened to ensure exposure of contaminant.
- 10.1.4.6 Monitor Support Building
- 10.1.4.6.1 The Monitor Support Building is not considered to be a hazardous waste management unit at the Tooele Chemical Agent Disposal Facility. However, since there is a potential for contamination of the structure and ventilation system by agents during routine Monitor Support operations, decontamination procedures similar to those for the Munitions Demilitarization Building will be employed during final closure activities.

**10.1.5      Closure of Containers<sup>2</sup> [40 CFR 264.178]**

**10.1.5.1      Container Handling Building and the S-2 warehouse**

10.1.5.1.1      It is anticipated that the Container Handling Building and the S-2 warehouse will be among the first hazardous waste management units to be decommissioned during facility closure activities. All waste munitions and some of the site-generated wastes will have been processed through the Tooele Chemical Agent Disposal Facility prior to initiation of facility closure.

10.1.5.1.2      Closure of the Container Handling Building will be considered complete upon certification by the independent registered professional engineer of the following activities:

10.1.5.1.2.1      Initial XXX decontamination following final munitions campaign (XXX decontamination verification will be based on the final agent processed and as per normal agent monitoring during facility operations). Decontamination procedures to be used are similar to those described previously for the Munitions Demilitarization Building. All interior surfaces will be decontaminated with the appropriate agent decontamination solution provided in Table I-1-3. Spent decontamination solution will be collected in the drain system within the structure, placed in drums or portable tanks, and transferred to the spent decontamination holding tank in the Toxic Cubicle. All spent decontamination solution will be incinerated in the Liquid Incinerators.

and;

10.1.5.1.2.2      One or both of the following closure verification steps is completed:

10.1.5.1.2.2.1      Clean Closure Sampling. Random and systematic sampling of the epoxy floor and sump coating system, respectively, will be conducted to confirm the effectiveness of the decontamination methods. Sampling methods will be in accordance with procedures established in SW-846 and as provided below.

10.1.5.1.2.2.2      For areas with less than 400 square feet, a minimum of four random scrape samples from the floor area coating and a minimum of one additional sample from each containment or collection sump and/or collection trench will be collected and analyzed (as per Section C-2, Waste Analysis Plan) for all agents processed at the facility.

10.1.5.1.2.2.3      In areas larger than 400 square feet, random scrape samples at a frequency of one per 100 square feet will be collected. In areas with multiple sumps, a minimum of one sample per sump will be collected. Trench collection systems will be sampled at a frequency of one

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<sup>2</sup>Closure of the Container Storage Areas (UPA, ECV, UPMC, and TMA) is addressed in the description of the closure of the MDB (Section 10.1.4.5).



sample per 10 linear feet of trench.

- 10.1.5.1.2.2.4 If analysis indicates nondetectable concentrations of all agents, no additional decontamination will be conducted. If an agent is detected, then additional decontamination and verification analysis steps may be undertaken (with manual collection of the liquid using portable equipment) or the procedure for coating system removal, below, will be employed.

10.1.5.1.2.3 Coating System Removal. The epoxy coating and the top 0.25 cm of concrete (or to exposed aggregate, whichever occurs first) is removed by grit blast or hydroblast techniques. Grit blast residues will be collected, containerized, and handled as hazardous waste in a manner consistent with the last agent processed. Hydroblast waters will be collected in area sumps and handled as described for rinse waters, below. The final decontamination step will be to rinse the walls, floor, sumps, and trenches with fresh water or steam clean. Rinse water or condensate will be manually collected from the sump(s) and incinerated in the Liquid Incinerators. No additional sampling of the decontaminated area will be conducted.

and;

- 10.1.5.1.2.3.1 Post-decontamination agent monitoring for a minimum of 3 months inside Container Handling Building verifies final XXX decontamination closure status.

10.1.5.1.3 Closure of the S-2 warehouse will be considered complete upon the certification by the independent registered professional engineer of the following activities:

- 10.1.5.1.3.1 Shipment of the secondary containment pallets off-site to an appropriate hazardous waste landfill facility following the removal of all site-generated waste from the S-2 warehouse. Decontamination of the pallets will not be necessary since only XXX-category site-generated waste will be stored on the pallets and the pallets will be managed as a hazardous waste

and;

- 10.1.5.1.3.2 After pallet removal, the S-2 warehouse will be monitored for a minimum of 3 months to verify final XXX closure status.

10.1.5.1.4 Closure verification sampling and cleanup contingencies for the soil and roadway surfaces in the immediate vicinity of the entrance apron to the CHB are addressed under 10.1.8.

## 10.1.5.2 Residue Handling Area

- 10.1.5.2.1 Closure of the Residue Handling Area will involve the removal and disposal at a licensed TSDF facility of all containerized hazardous wastes in storage at the time closure of the Brine Reduction Area Tank System commences, followed by decontamination of the

building's interior surfaces (walls and floor). Closure of this area will be in conjunction with closure of the Brine Reduction Area that is located adjacent to the temporary storage area [see 10.1.6]. The projected types of containerized waste that will have to be shipped to an offsite permitted hazardous waste facility during closure are:

- Brine salt generated during closure
- Incinerator ash
- Baghouse dust and cyclone residue
- Miscellaneous nonagent related wastes generated during facility closure

10.1.5.2.2 Upon removal of the final quantity of waste from the Residue Handling Area, the interior walls and floor adjacent to the storage area will be spray rinsed or steam cleaned with general purpose decontamination solution (see Table I-1-3) or a heavy-duty solution, as appropriate, to remove brine dust and residues. The interior of the building adjacent to the storage area will then be rinsed with fresh water. It is anticipated that one to two additional washings with the decontamination solution may be necessary to complete closure of this area. The wash and rinse waters will be collected and transported to the Liquid Incinerators or mobile incinerator for incineration, or if a mobile incinerator is not permitted and available for use at the Tooele Chemical Agent Disposal Facility closure, these wastes will be shipped offsite to a licensed TSDF for disposal. It is not anticipated that physical decontamination methods such as grit blasting or hydroblasting will be necessary to complete closure. If grit blasting or hydroblasting is employed, residue management will be as indicated for the Brine Reduction Area closure procedures.

## **10.1.6 Closure of Tank Systems [40 CFR 264.197]**

10.1.6.1 The Tooele Chemical Agent Disposal Facility consists of three separate permitted hazardous waste tank systems. The tank systems vary in design and complexity, and consist of any or all of the following system components: tanks, collection sumps, secondary containment sumps, concrete (in-floor) collection trenches, pumps, valves, and other ancillary equipment. The three tank systems include:

- Agent Collection Tank System - This tank system includes the agent collection systems in the Explosive Containment Room and the Munitions Processing Bay as well as all associated piping and ancillary equipment, and extends to the inlet of the Liquid Incinerators. The agent collection system also includes the agent storage tanks and a secondary containment sump in the Toxic Cubicle. There are no floor sumps or trenches located in process areas that are associated with the agent collection system. However, collection sumps and trenches are part of the agent collection tanks secondary containment system. The agent collection system is located entirely within Category A areas in the Munitions Demilitarization Building.

- Spent Decontamination Solution Tank System - While not intended specifically for agent collection, the spent decontamination solution tank system collects incidental quantities of agent from routine decontamination operations within the Munitions Demilitarization Building. The spent decontamination holding tank system consists of numerous sumps and concrete collection trenches of varying length, pumps, ancillary piping and equipment, and the three spent decontamination holding tanks located in the Spent Decontamination Solution Room. Three separate pipe headers and pump systems compose the spent decontamination holding tank system--one each originating from Category A, A/B, B, and C process areas.
- Brine Reduction Area Tank System - This system extends from the pollution abatement systems of the Metal Parts Furnace, Deactivation Furnace System, and Liquid Incinerators in the Munitions Demilitarization Building to the tanks. It includes the four brine storage tanks located outside of the Process Utilities Building.

10.1.6.2 A summary of the principal tank systems and their individual capacities is provided in Table I-1-4. Ancillary sumps (i.e., Intermittent Collection Units) associated with munitions processing are summarized in Table I-1-5, and RCRA permitted secondary containment sumps located in the MDB and connected to the SDS are listed in Table I-1-6.

10.1.6.3 Agent Collection Tank System

10.1.6.3.1 Following completion of the final agent demilitarization campaign, but prior to the official commencement of closure operations, the Munitions Demilitarization Building will be initially decontaminated to XXX according to normal operating procedures. This initial effort will include XXX decontamination of the agent collection tank system. While the Liquid Incinerators will remain in service to support each facility's closure operations, the agent collection tank system will no longer be needed.

10.1.6.3.2 The agent collection tank system will be closed following removal of all munitions draining equipment located in the Explosive Containment Room and the Munitions Processing Bay. Equipment in both of these areas are directly connected to the agent collection system. [Note: The Explosive Containment Room and the Munitions Processing Bay will be closed as an element of the Spent Decontamination Solution Tank System.] No sumps are associated with the agent collection system, except the secondary containment sump in the Toxic Cubicle (see Table I-1-5).

10.1.6.3.3 The appropriate decontamination solution from Table I-1-3 used in the final agent campaign will be flushed through the piping system until such time as no agent is detected in samples of the decontamination solution as it enters the agent collection tanks. Agent analysis will be in accordance with methods identified in Attachment 2, Waste Analysis

Plan. All spent decontamination solution will be incinerated in the Liquid Incinerators. Following decontamination, the collection lines will be purged with a fresh water rinse, with the rinse water also incinerated in the Liquid Incinerators.

Table I-1-4A  
TANK SUMMARY TABLE

Tank Designation	Tank Use	Capacity (gallons)
ACS-TANK-101	Agent Holding Tank	582
ACS-TANK-102	Agent Surge Tank	1,130
SDS-TANK-101	Spent Decontamination Solution Storage Tank	2,200
SDS-TANK-102	Spent Decontamination Solution Storage Tank	2,200
SDS-TANK-103	Spent Decontamination Solution Storage Tank	2,200
BRA-TANK-101	Brine Storage Tank	42,900
BRA-TANK-102	Brine Storage Tank	42,900
BRA-TANK-201	Brine Storage Tank	42,900
BRA-TANK-202	Brine Storage Tank	42,900

Table I-1-4B  
SUB-PART X SUMMARY TABLE

Designation	Sub-Part X, Miscellaneous Unit Use	Capacity (gallons)
BRA-DDYR-101	Brine Drying System, Dryer	730
BRA-DDYR-102	Brine Drying System, Dryer	730
BRA-DDYR-201	Brine Drying System, Dryer	730
BRA-EXCH-101	Brine Drying System, Exchanger	1,000
BRA-EVAP-101	Brine Drying System, Evaporator	1,200
BRA-EVAP-102	Brine Drying System, Evaporator	1,200
BRA-EXCH-102	Brine Drying System, Exchanger	1,000

Table I-1-5 and Table I-1-6, 24 HOUR INTERMITTENT COLLECTION UNITS and NONPERMITTED SUMPS WITH SECONDARY DESIGN MUNITIONS DEMILITARIZATION BUILDING Tables moved, reference body of the Permit, Table 14, Hazardous Waste Storage Tank Systems.

- 10.1.6.3.4 All aspects of the agent collection system, including the tanks, piping, pumps, and other ancillary equipment originating from Category A areas will be disassembled and cut into pieces as necessary to be XXXXX decontaminated in either the Metal Parts Furnace or the mobile incinerator. [If the Metal Parts Furnace is not available and] if a mobile incinerator is not permitted and available for use at the Tooele Chemical Agent Disposal Facility closure, these wastes will be shipped offsite to a licensed TSDF for disposal. Only the floor area and secondary containment sump in the Toxic Cubicle will remain following disassembly of the tank system (see discussion below). Following XXXXX decontamination and certification by the installation Commander's representative and the independent engineer, the scrap will be released from government custody. XXXXX decontamination verification techniques will be performed during normal facility operations for munitions scrap.
- 10.1.6.3.5 The Toxic Cubicle, including the floor and secondary containment sump will be finally decontaminated by following 10.1.5.1.2.2 through 10.1.5.1.2.3.1.
- 10.1.6.3.6 Individual unit closure (i.e., partial closure) of the agent collection tank system will be considered complete following completion of these tasks. The certifying engineer will note the date of completion in the closure logbook. Closure certification will be made following completion of the 3-month post-decontamination agent monitoring program for the entire Munitions Demilitarization Building (note: this 3-month post decontamination monitoring program and associated certification encompasses the TMA container storage area).
- 10.1.6.4 Spent Decontamination Holding Tank System
- 10.1.6.4.1 The spent decontamination holding tank system will be closed systematically with the general decommissioning of the Munitions Demilitarization Building. Final closure of these tank systems cannot be completed until all removable equipment (including sumps and trenches that are fitted with removable steel insert catchments) in Category A, A/B, B, and C process areas has been disassembled, decontaminated, and removed from the building. Elements of the decontamination solution collection system located in Category A, A/B, and B process areas will be disassembled and thermally treated to XXXXX decontamination. Category C process areas will only receive XXX decontamination.
- 10.1.6.4.2 The spent decontamination solution tank systems (see Tables I-1-4 through I-1-6) will be closed following initial XXX decontamination of the Munitions Demilitarization Building after the final agent campaign, removal of all demilitarization equipment, and closure of the agent collection tank system. Following closure of the agent collection system (in the Munitions Processing Bay and Explosive Containment Room), final decontamination and disassembly of the spent decontamination collection system will proceed.
- 10.1.6.4.3 Decontamination solution wash(es) of the individual process area walls, floors, sumps, etc., will be conducted until no agent is detectable in samples collected at the inlet to the

three tanks in the Spent Decontamination System Room. The pump and piping systems will then receive a final fresh water rinse. All rinsate will be incinerated in the Liquid Incinerators. When this is achieved, the sump pump assemblies will be removed and the pipelines capped at the connection to the 2-inch-diameter pipe that runs to the collection tanks. The 2-inch-diameter pipelines will be systematically removed as each area is decommissioned.

- 10.1.6.4.4 The Spent Decontamination Holding Tank System will be decontaminated by following closure conditions 10.1.5.1.2.2 through 10.1.5.1.2.3.
- 10.1.6.4.5 Initially, two of the three spent decontamination holding tanks at the Munitions Demilitarization Building will be removed from service, disassembled, and XXXXX decontaminated in the Metal Parts Furnace or the mobile incinerator, or if a mobile incinerator is not permitted for use at the Tooele Chemical Agent Disposal Facility closure, these wastes will be shipped offsite to a licensed TSDF for disposal. The third tank will remain as the only operable feed tank to the Liquid Incinerators during remaining decontamination efforts conducted during closure of the facility. After completion of Liquid Incinerator Operations, the third tank and any remaining elements of the three collection system pipelines will be disassembled, cut into pieces as necessary, and decontaminated (XXXXX) in the mobile incinerator.
- 10.1.6.4.6 Closure of the Spent Decontamination Solution Room that serves as the secondary containment system for the spent decontamination holding tanks will be decontaminated following disassembly of the last decontamination solution holding tank and remaining ancillary equipment. Closure verification for the trench and sump system and the individual containment sumps for the three spent decontamination holding tanks will be in the same manner as that described above for the collection portion of the spent decontamination holding tank system.
- 10.1.6.4.7 Individual unit closure (i.e., partial closure) of the spent decontamination holding tank system at the facility will be considered complete following completion of these tasks. The certifying engineer will note the date of completion in the closure logbook. Closure certification will be made following completion of the 3-month post-decontamination agent monitoring program for the entire Munitions Demilitarization Building.
- 10.1.6.5 Brine Reduction Area Tank System
- 10.1.6.5.1 The Brine Reduction Area Tank System consists of four brine storage tanks located outside of the Process Utilities Building, two recirculating brine evaporators, and three rotary double drum dryers located within the Process Utilities Building. This system also includes all ancillary piping and secondary containment devices. The Brine Reduction Area will be operational until it is no longer needed (i.e., when the Liquid Incinerators and mobile incinerator, if connected to the Brine Reduction System during closure activities, are closed). The remaining brine solution will be processed through the dryers prior to commencement of unit closure. The salt generated during closure will be containerized

and shipped offsite to a licensed TSDF, or transferred to the installation's Residue Handling Area for consolidation and offsite shipment (within 90 days).

- 10.1.6.5.2 The Brine Reduction Area will be one of the last hazardous waste management unit operations to be closed. In conjunction with closure of the Brine Reduction Area tank system, the temporary container accumulation and storage area used for packaging and consolidating brine salts during facility operations will also be decontaminated. All process equipment (including tanks, dryers, etc.) and miscellaneous piping, generated during closure of the Brine Reduction Area will be decontaminated using physical (e.g., grit blasting or hydroblasting) and/or liquid residue removal methods and disassembled.
- 10.1.6.5.3 The tanks, rotary drum dryers, and evaporators will be disassembled, brushed, scraped, or grit blasted or hydroblasted as appropriate to remove heavy residue (salt) accumulation, and washed or steam cleaned using a detergent and/or heavy-duty cleaning solution (see Table I-1-3) until no residues are visibly apparent.
- 10.1.6.5.4 After decontamination of the equipment has been completed, tanks, dryers, exchangers, evaporators, and piping, etc., will be cut into small pieces, where practicable, for scrap, and released from government custody.
- 10.1.6.5.5 Following equipment removal from the Brine Reduction Area, the interior structure of the Process Utilities Building will be decontaminated using high-pressure washing and/or steam cleaned using the general or heavy-duty cleaning solutions identified in Table I-1-3. Based on facility personnel's evaluation of the extent of salt residues in the area following removal of processing equipment, grit blasting or hydroblasting techniques may be employed to remove heavier residue accumulations prior to washing as the final decontamination step.
- 10.1.6.5.6 In all instances where grit blast techniques are employed during closure, blast residues will be collected using normal hand tools (e.g., shovels, brooms, etc.) and heavy-duty portable and wheeled vacuum sweepers (as necessary), containerized, and disposed of in a manner that is consistent with the brine salts of the most recent agent demilitarization campaign.

## **10.1.7 Closure of Incinerators [40 CFR 264.351]**

- 10.1.7.1 The incinerators/furnaces, including their pollution abatement systems, will be shut down and permanently taken out of service as sequentially indicated in Table I-1-7. Any remaining waste materials as part of the agent demilitarization campaign will be processed through the respective system prior to initiation of closure. Similar to normal operational procedures all of the incineration/furnace systems will then be initially XXX decontaminated. To augment the closure of the overall facility, incinerator/furnace closure and disassembly will occur in a sequential manner with the decontamination residues and disassembled parts thermally treated in one of the remaining active units. Although not addressed in this permit application, a mobile incinerator will be brought to the facility to support closure as the onsite facility incinerators are decommissioned, or if a mobile



incinerator is not permitted and available for use at the Tooele Chemical Agent Disposal Facility closure, these wastes will be shipped offsite to a licensed TSDF for disposal.

Table I-1-7  
MUNITIONS DEMILITARIZATION BUILDING  
INCINERATOR CLOSURE SEQUENCE AND FATE

MUNITIONS DEMILITARIZATION BUILDING	
Sequence of Closure	Fate
1. Deactivation Furnace System	<ul style="list-style-type: none"> <li>○ Spent decontamination solutions to Liquid Incinerators</li> <li>○ Disassembled parts to Metal Parts Furnace</li> </ul>
2. Dunnage Incinerator	<ul style="list-style-type: none"> <li>○ Used Demilitarization Protective Ensembles to Metal Parts Furnace or mobile incinerator</li> <li>○ Spent decontamination solutions to Liquid Incinerators</li> <li>○ Disassembled parts to Metal Parts Furnace or mobile incinerator</li> </ul>
3. Metal Parts Furnace	<ul style="list-style-type: none"> <li>○ All feed and disassembled parts to mobile incinerator</li> <li>○ Spent decontamination solutions to Liquid Incinerators</li> <li>○ Carbon and filters to mobile incinerator</li> </ul>
4. Liquid Incinerators	<ul style="list-style-type: none"> <li>○ Spent decontamination solution and disassembled parts to mobile incinerator</li> </ul>
<u>MOBILE INCINERATOR</u>	
	<ul style="list-style-type: none"> <li>○ Remove from site</li> </ul>

Note: Mobile incinerator to be brought onsite prior to or at closure of the first incinerator unit closure, or if a mobile incinerator is not permitted and available for use at the Tooele Chemical Disposal Facility closure, these wastes will be shipped offsite to a licensed TSDF for disposal.

10.1.7.2 Disassembled incineration/furnace equipment will be decontaminated as follows:

- Deactivation Furnace
  - XXX From outlet of slagging afterburner and all of Pollution Abatement System
  - XXXXX From munitions feed chute through heated scrap discharge conveyor, and through slagging afterburner
- Dunnage Incinerator
  - XXX From outlet of Dunnage afterburner through Pollution Abatement System
  - XXXXX From ram charger through ash dropout chute, and through Dunnage afterburner
- Metal Parts Furnace
  - XXX From discharge of afterburner through the Pollution Abatement System
  - XXXXX From inlet airlock through exit airlock, and through afterburner
- Liquid Incinerators
  - XXX From outlet of afterburner (2nd Stage Incinerator) through Pollution Abatement System including stack
  - XXXXX From agent feed in vortex burner through the afterburner

10.1.7.3 Following initial decontamination, removal, disassembly, and XXX or XXXXX final parts decontamination of each respective incinerator/furnace, as indicated above, the room(s) in the Munitions Demilitarization Building in which the system was formerly housed will be finally XXX decontaminated. All interior surfaces will be decontaminated with the appropriate agent decontamination solution provided in Table I-1-3. Spent decontamination solution will be collected from the decontamination sump(s) or trenches using portable equipment, and transferred either to the spent decontamination solution tank (if still in service) for incineration in the Liquid Incinerators or to the mobile incineration system, or if a mobile incinerator is not permitted and available for use at the Tooele Chemical Agent Disposal Facility closure, these wastes will be shipped offsite to a licensed TSDF for disposal.

10.1.7.4 As provided below, verification sampling and/or removal of the epoxy concrete coating system will be performed to confirm the effectiveness by following 10.1.5.1.2.2 through

10.1.5.1.2.3.1.

**10.1.8      Facility Soils Investigation at Closure**

10.1.8.1      The specialized munitions handling equipment and inspection/decontamination procedures, other engineered systems such as the Munitions Demilitarization Building and its associated munitions processing equipment, and continuous facility agent monitoring system are intended to preclude (or detect) most anticipated non-random, systematic events (e.g., tank leaks) that could lead to a release of agent or related hazardous waste to facility soils. However, an unplanned release of agent or other hazardous waste may occur during the operational life (including the closure period) of the Tooele Chemical Agent Disposal Facility.

10.1.8.2      While the engineered safeguards of the Tooele Chemical Agent Disposal Facility (such as the incineration systems and the secondary containment devices for munitions storage areas and tank systems) are designed to prevent facility operational failures, one of the most likely causes of an unplanned release of hazardous waste to facility soils would be transportation related (including loading and unloading operations); either occurring during transportation of munitions from the installation's stockpile storage area to the Container Handling Building, transportation of munitions from the Container Handling Building to the Munitions Demilitarization Building or during transportation of process related hazardous waste (e.g., brine salts, incinerator ash, etc.) to the offsite hazardous waste disposal facility.

10.1.8.3      If such events occur during the life of the facility, response and clean-up procedures are detailed in the facility's Contingency Plan , Attachment 9.

10.1.8.4      To provide verification that facility soils do not pose a threat of post-closure escape of agent or related hazardous waste or hazardous constituents to the environment, facility soils in the proximity of the regulated waste management units, and all hazardous waste loading/unloading areas will be sampled and analyzed for all agents processed at the facility, or non-agent hazardous constituents, as applicable for areas related to process wastes. Areas to be addressed include the following:

10.1.8.4.1      Transportation Routes (Agent Related)

- All onsite roadways in which unprocessed agent are transported, including roadway from installation storage area to the Container Handling Building, and from the Container Handling Building to the Munitions Demilitarization Building.
- Munitions receiving area outside the Container Handling Building.
- Munitions receiving area at the Munitions Demilitarization Building.

10.1.8.4.2      Transportation and Process Waste Discharge Areas (Nonagent Related)

- All onsite roadways in which demilitarization process hazardous wastes are transported.
- Deactivation Furnace System discharge and residue collection area.
- Dunnage Incinerator baghouse.
- Dunnage Incinerator ash removal and residue collection area.
- Process Utilities Building loading/unloading area.

10.1.8.5 Other areas will be sampled, as appropriate. Prior to closure of the facility, the independent registered professional engineer responsible for closure certification will review with the installation Commander's representative (or the Emergency Coordinator) all facility operating records pertaining to spills, releases, or other unplanned events. If releases occurred during operations, the record of response will be examined. A determination by the independent engineer as to whether the response action was appropriate. If documentation of the cleanup and follow-up verification sampling does indicate that the release was removed to background levels, no closure verification sampling of that area will be conducted. [Note: The Contingency Plan provides details on the planned response action(s) for agent and non-agent related spills. The criteria for cleanup of all spills to facility soils is complete removal.]

10.1.8.6 Background Soils Investigation

10.1.8.6.1 Prior to construction of the Tooele Chemical Agent Disposal Facilities, onsite soil sampling will be conducted to establish background levels of hazardous constituents. At least five background soil samples will be collected for analysis. At each location, individual samples will be collected at 1.5 to 2 foot intervals (depending on actual sampling equipment used) to a total depth of 10 feet (or until groundwater is encountered, whichever occurs first). Samples will be taken in areas determined by installation officials to be unaffected by previous waste management or munitions management activities. Samples will be taken from similar geologic strata and at similar depths to the depths for comparison during closure of the chemical stockpile disposal system facility. From the sampling, the background concentration for each constituent will be established at each depth interval.

10.1.8.6.2 Wide variations in the concentration of hazardous constituents in background samples will not be acceptable. The mean of each hazardous constituent concentration of the background samples (not including the background sample with the highest concentration of that constituent) must be compared to the background sample with the highest concentration of that constituent. If the difference is within four sample standard deviations of the mean (two sample standard deviations if log values are being used rather than actual values), then the background sample with the highest constituent concentration may be included in the background set. Otherwise, another background sample will be obtained which meets these criteria.

- 10.1.8.6.3 All background soil samples will be analyzed for the priority pollutants using the appropriate methods established in the most current version (at the time of sampling) of the EPA document SW-846, Test Methods for Evaluating Solid Waste. Organic constituent analysis will employ the gas chromatograph/mass spectrometry analytical methods. In addition, each sample will be analyzed for the presence of the individual agents to be processed at the facility. All analysis for agent will be in accordance with Attachment 2, Waste Analysis Plan.
- 10.1.8.7 Agent-Related Area Sampling
- 10.1.8.7.1 All facility roadways and shoulder areas in which agent has been transported on a regular basis during demilitarization operations will be sampled for the presence of agent during closure activities. Sample results will be compared to the background values established prior to construction of the Tooele Chemical Agent Disposal Facility. If the concentration of agent in each sample is within the established background concentration plus two sample standard deviations, then the background concentration for the agent has been achieved. Decontamination efforts will be carried out until this criterion is achieved.
- 10.1.8.8 Roadways.
- 10.1.8.8.1 Road surface chip samples will be collected every 50 linear feet along the centerline crown and at both edges of the pavement. From each station, the three samples will be composited and analyzed for each agent processed at the facility. If agent is detected above the established background at any sample location, additional sampling on 10-foot centers in each direction will be conducted to determine the extent of agent presence. Prior to final closure of the facility, asphalt areas determined to have agent present, if any, will be removed to the base material and incinerated in the mobile incinerator. If the surface is Portland cement concrete, the concrete will either be removed, or grit blasted to remove the top 0.25 cm of concrete. Residues, if any, will be incinerated in the mobile incinerator, or if a mobile incinerator is not permitted and available for use at the Tooele Chemical Agent Disposal Facility closure, these wastes will be shipped offsite to a licensed TSDF for disposal.
- 10.1.8.9 Loading and Unloading Areas.
- 10.1.8.9.1 Portland cement concrete aprons adjacent to loading and unloading areas of the Container Handling Building, and the Munitions Demilitarization Building will be sampled for agent. Concrete chip samples will be collected at a frequency of one sample per 100 square feet. If agent is detected above the established background, the concrete will either be removed, or grit blasted (removal of top 0.25 cm of surface). Residues, if any, will be incinerated in the mobile incinerator, or if a mobile incinerator is not permitted and available for use at the Tooele Chemical Agent Disposal Facility closure, these wastes will be shipped offsite to a licensed TSDF for disposal.
- 10.1.8.10 Roadway Shoulders.
- 10.1.8.10.1 Roadway shoulders will be sampled at the same frequency as the roadway surface, every 50

linear feet. On each side, one sample at the edge of the pavement surface, and one sample 5 feet off the pavement will be collected. The sample will be collected to a total depth of 1 foot. The two samples at each location (from the same side) will be composited and analyzed for each agent processed at the facility. If agent is detected above the established background, additional sampling will be conducted on a 5-foot grid away from the sample location and at 1.5- to 2-foot intervals vertically to define the extent of agent presence. Once defined, these areas, if any, will be excavated until background agent levels are achieved.

- 10.1.8.10.2 Excavated soils and other residues will be incinerated in the mobile incinerator, or if a mobile incinerator is not permitted and available for use at the Tooele Chemical Agent Disposal Facility closure, these wastes will be shipped offsite to a licensed TSDF for disposal. All excavated area will be replaced with clean fill material.

10.1.8.11 Soils Adjacent to Loading and Unloading Areas.

- 10.1.8.11.1 Soils adjacent to the Container Handling Building and the Munitions Demilitarization Building munitions loading and unloading areas will be sampled and analyzed for the presence of each agent processed at the facility. Samples of soil at the edge of the apron and at a distance of 5 feet away will be collected every 10 linear feet around the perimeter of the building loading apron. The sample will be collected to a total depth of 1 foot. The two samples at each perimeter location will be composited and analyzed for each agent processed at the facility. If agent is detected above the established background, additional sampling will be conducted on a 5-foot grid away from the sample location and at 1.5- to 2-foot intervals vertically to define the extent of agent presence. Once defined, these areas, if any, will be excavated until the background level is achieved. Excavated soils and other residues will be incinerated in the mobile incinerator, or if a mobile incinerator is not permitted and available for use at the Tooele Chemical Agent Disposal Facility closure, these wastes will be shipped offsite to a licensed TSDF for disposal. All excavated area will be replaced with clean fill material.

10.1.8.12 Nonagent-Related Area Sampling

- 10.1.8.12.1 During facility closure, a soil sample verification program will be conducted for roadway and loading/unloading areas of the facility that are used to transport nonagent-related hazardous wastes such as brine salts. The sampling strategy will be identical to that described above for agent related areas. However, two major differences exist:
- Soil samples will be analyzed for priority pollutant metals only (total metal analysis).
  - In lieu of or in conjunction with pavement removal (as needed), a decontamination program may be employed using a heavy duty cleaning solution or steam cleaning (see Table I-1-3). See Section 10.1.5 for a discussion of similar cleaning methods for the temporary container storage area in the Process Utilities Building, and Section 10.1.6 for a discussion of the decontamination techniques for the Brine Reduction Area tank system.

- 10.1.8.12.2 If the concentration of the analyzed hazardous constituents in the soil is within the established background concentration plus two standard deviations, then the background concentration for the constituent has been achieved. If levels in excess of the background are found, additional sampling as described for agent related areas will be conducted until the extent of contamination is determined.
- 10.1.8.12.3 If soil removal is necessary, excavation will be conducted until soil background is achieved. All residue generated will be characterized in accordance with 40 CFR Part 262, Subpart C, Characteristics of Hazardous Waste.
- 10.1.8.12.4 The independent registered professional engineer will review documentation of the facility soils investigation, which will be included in the final facility closure certification. Documentation of the soils investigation and all record of soil/pavement removal will be maintained in the engineer's logs.

**10.1.9 Disposal or Decontamination of Equipment, Structures, and Soils [40 CFR 264.114]**

- 10.1.9.1 During closure of the Tooele Chemical Agent Disposal Facility, wastes will be generated from closure activities. At or before final closure, all hazardous wastes that are to be thermally treated that are generated during closure will be processed through one of the facility incinerators or the mobile incinerator, or if a mobile incinerator is not permitted and available for use at the Tooele Chemical Agent Disposal Facility closure, these wastes will be shipped offsite to a licensed TSDF for disposal. Hazardous wastes generated during closure that will not be thermally treated (e.g., brine salts) will be shipped offsite to a licensed TSDF for disposal. Waste management during closure will be in accordance with the RCRA permit (for wastes such as ash, brine salts, etc., that are routinely generated during the operating life of the facility) and in accordance with the Standards Applicable to Generators of Hazardous Waste (40 CFR Part 262) for waste(s) that may be unique to closure activities.
- 10.1.9.2 All wastes from the final agent demilitarization campaign will be removed from the facility prior to commencement of closure.
- 10.1.9.3 It is not anticipated that soil removal will be necessary during closure because any incidents involving agent release (or other hazardous waste) during the operational life will be addressed under the facility Contingency Plan. If soil removal is necessary during closure, residues containing detectable levels of agent will be thermally treated (XXXXX) in the mobile incinerator, and disposed of at an offsite licensed TSDF [see Section 10.1.8], or if a mobile incinerator is not permitted and available for use at the Tooele Chemical Agent Disposal Facility closure, these wastes will be shipped offsite to a licensed TSDF for disposal.

**10.1.10 Schedule for Closure [40 CFR 265.112(b)(6)]**

- 10.1.10.1 The overall closure of the facility will be completed by an integrated sequence of unit-by-unit closures (i.e., partial closures) until all hazardous waste management units have been closed. Each partial closure activity will be completed within 180 days of initiating each unit closure. It is anticipated that final closure of the entire Tooele Chemical Agent Disposal Facility will



take from 270 days to 1 year from the date of beginning the first unit closure. It is further anticipated that individual unit closures may occur concurrently with other unit closure activities (e.g., closure of the Container Handling Building may be concurrent with closure of the agent holding tanks). The proposed closure sequence of the facility, on a unit-by-unit partial closure basis is summarized in Table I-1-8.

**Table I-1-8  
FACILITY CLOSURE SEQUENCE**

Closure Sequence	Hazardous Waste Management Unit	Other Closure Activity Underway (Nonhazardous Waste Management Units)	Estimated Time to Complete Closure or Activity
1	Closure of Container Handling Building (XXX), and the S-2 warehouse (XXX), and Closure of Agent Holding Tank Systems (XXXXX), Processing of waste stored in the TMA, UPA, ECV, and UPMC.	Disassembly and decontamination (XXXXX) of processing equipment (e.g., rocket drain station, shear machine, bulk drain station, mechanical demilitarization equipment, conveyors, etc.). Disassemble and decontaminate (XXXXX) all but one decontamination solution holding tank.	4 months (includes post-decontamination agent monitoring of holding areas)
2	Closure of Deactivation Furnace System (XXXXX) (feed chute, kiln, heated discharge conveyor, hot cyclone, and afterburner)	Disassembly of Deactivation Furnace System Pollution Abatement System. Decontamination will be by nonthermal methods (e.g., grit blast, or hydroblast and high pressure general decontamination solution wash).	2 months
3	Closure of Dunnage Incinerator (XXXXX) (conveyor, primary chamber, and afterburner)	Disassembly of Dunnage Incinerator Pollution Abatement System. Decontamination will be by nonthermal methods (e.g., grit blast, or hydroblast and high pressure general decontamination solution wash).	2 months
4	Closure of Metal Parts Furnace (XXXXX) (conveyor, primary chamber, and afterburner)	Disassembly of Metal Parts Furnace Pollution Abatement System. Decontamination will be by nonthermal methods (e.g., grit blast, or hydroblast and high pressure general decontamination solution wash).	2 months

**Table I-1-8  
FACILITY CLOSURE SEQUENCE**

Closure Sequence	Hazardous Waste Management Unit	Other Closure Activity Underway (Nonhazardous Waste Management Units)	Estimated Time to Complete Closure or Activity
5	Closure of Liquid Incinerators (XXXXX) (primary and secondary burners)	<p>Disassembly of Liquid Incinerator Pollution Abatement System. Decontamination will be by nonthermal methods (e.g., grit blast, or hydroblast and high pressure general decontamination solution wash).</p> <p>Final decontamination of Munitions Demilitarization Building (XXX). (This decontamination includes the TMA, UPA, ECV, and UPMC .)</p> <p>Deactivation and removal of Munitions Demilitarization Building ventilation systems.</p>	1.5 months
6	Closure of Brine Reduction System brine holding tanks, recirculating evaporators, drum dryers). Decontamination will be by nonthermal methods (e.g., grit blast, or hydroblast and high pressure general decontamination solution wash).	Removal of final containerized wastes from closure operations.	1 month
7	Closure of BRA PAS system, (Knockout Box, Baghouse Modules)	Disassembly of BRA Pollution Abatement System. Decontamination will be by non-thermal methods (e.g., decontamination solution wash).	1 month
8	Closure of Mobile Incinerator and removal from site (not part of this permit)		
9	Completion of agent monitoring programs		3 months

**Table I-1-8**  
**FACILITY CLOSURE SEQUENCE**

Closure Sequence	Hazardous Waste Management Unit	Other Closure Activity Underway (Nonhazardous Waste Management Units)	Estimated Time to Complete Closure or Activity
10	Certification of Closure		Periodic inspections during closure activities.

**10.1.11      Extension of Closure [40 CFR 264.113]**

- 10.1.11.1      Closure of the Tooele Chemical Disposal Agent Facility will be accomplished through a series of unit-by-unit closures of individual hazardous waste management units. It is not expected that any unit closure will exceed the 180 day allowed (for each unit when partial closures are conducted). It is anticipated, owing to the complex nature of the facility, the extensive decontamination procedures to be implemented during closure, and the extremely hazardous nature of the lethal chemical agent treated at the facility, that final facility closure will be completed within 270 days to 1 year following commencement of the first hazardous waste management unit closure.
- 10.1.11.2      It is the intent of the Army to certify final closure of all regulated units (tank systems and incinerators) located within the Munitions Demilitarization Building upon completion of the post-decontamination agent monitoring program within the building. This monitoring program will be conducted for a minimum of 3 months following completion of all decontamination activities within the building and is essential in completing the safe decommissioning of the Tooele Chemical Agent Disposal Facility.
- 10.1.11.3      In some instances such as closure of the agent collection tank system (one of the first units to be closed), the overall time period (from start of tank closure to completion of agent monitoring program in the building) may exceed 180 days, even though actual closure activities for the individual tank system will be completed in less than 180 days.
- 10.1.11.4      Since overall certification that the Tooele Chemical Agent Disposal Facility has been properly closed and will not present any future threats to human health or the environment is the primary goal, the Army requests that all hazardous waste management units located within the Munitions Demilitarization Building be given a closure time period extension to a maximum of one calendar year following initiation of closure activities (i.e., commencement of closing the agent tank system), with the elapsed closure time period not to exceed one-year. This one year time frame is for overall closure of the Munitions Demilitarization Building, including all units therein and including the minimum 3-month post-decontamination agent monitoring program.
- 10.1.11.5      If closure of all units within the Munitions Demilitarization Building has not been initiated within 180 days of the initiation of the first unit closure (i.e., agent tank system), the Army will prepare a revised schedule and extension request with supporting documentation on closure progress and reasons why additional time is needed to complete closure.
- 10.1.11.6      Similarly, if the final volume of hazardous waste in any other permitted unit cannot be completely removed within 90 days or the unit completely closed within the allowable 180 days, the Army will submit a closure extension request at least 30 days prior to expiration of the 90- or 180-day periods, respectively.
- 10.1.11.7      In all instances of closure extension, the Army will take all steps necessary to prevent threats to human health or the environment from unclosed but not operating hazardous waste management unit(s), including compliance with all applicable permit conditions pertaining to

that unit(s).

**10.1.12      Certification of Closure [40 CFR 264.115]**

- 10.1.12.1      Within 60 days of completion of the final facility closure procedures described above, a representative of the facility Commander will submit a certification, signed by the Commander and an independent registered professional engineer, that the Tooele Chemical Agent Disposal Facility has been closed in accordance with this closure plan and all applicable regulations. Since the facility does not have any regulated disposal units, only certification of final closure of the Tooele Chemical Agent Disposal Facility will be submitted. Documentation of closure activities for each regulated unit will be maintained by the certifying independent registered professional engineer.
- 10.1.12.2      Since overall facility closure will be accomplished through a series of unit-by-unit closures, the independent registered professional engineer will make periodic inspections during the closure period. These inspections relative to closure are also denoted in Figure I-1-4.

1 . Closure sequence may vary slightly depending on conditions during closure.